

Assignment: Approximate Numbers and Change of Units

Question 1. (3 marks) How many significant digits

- a. 50 **1**
 b. 50. **2**
 c. 50.0 **3**
 d. 0.005 **1**
 e. 0.0050 **2**
 f. 3243 **4**

Question 2. (1 mark) How many significant digits are in 2.410×1030 , why?**3 sig. fig.** since for mult take least # of sig. fig.**Question 3.** (1 mark) Round

- a. 2342223.32 to 3 significant digits. **2340000**
 b. 0.034200 to 1 significant digit. **0.03**

Question 4. (4 marks) (use the correct number of significant figures)

- a. $45.2 + 16.730$ **61.9**
 b. $23 - 26.2$ **-3**
 c. $16.7 \times 33.2 \times 16.72$ **9270**
 d. $346 \div 22$ **16**
 e. $(32.2 + 16.235) \times 22$ **1100**
 f. $(23.7 \times 13) - (23.5 \div 2.13)$ **300**

Question 5. (2 marks) Convert 2550 square feet to

- a. m^2
- b. $inch^2$

$$a) 2550 \text{ ft}^2 \cdot \frac{0.305 \text{ m}}{1 \text{ ft}} \cdot \frac{0.305 \text{ m}}{1 \text{ ft}} \\ = 237.2 \text{ m}^2 = 237 \text{ m}^2$$

$$b) 2550 \text{ ft}^2 \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \\ = 367\,200 \text{ in}^2 \\ = 367\,000 \text{ in}^2$$

Question 6. (1 mark) Convert 21 000 psi (lbs/in²) to Mpa.

$$21\,000 \frac{\text{lb}}{\text{in}^2} \cdot \frac{1 \text{ M}}{10^6} \cdot \frac{4.45 \text{ Kg} \cdot \text{m}}{1 \text{ lb}} \cdot \frac{39.37 \text{ in}}{1 \text{ m}} \cdot \frac{39.37 \text{ in}}{1 \text{ m}} = 144.85 \frac{\text{M Kg}}{\text{s}^2 \cdot \text{m}^2} \\ = 140 \text{ MPa}$$

Question 7. (2 marks) Convert 65 miles/hr to

- a. km/hr
- b. ft/sec

$$a) 65 \frac{\text{mi}}{\text{hr}} \cdot \frac{1.6 \text{ km}}{1 \text{ mi}} = 104.65 \text{ km/hr} = 1.0 \times 10^2 \text{ km/hr}$$

$$b) 65 \frac{\text{mi}}{\text{hr}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{1 \text{ min}}{60 \text{ s}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} = 96.3 \frac{\text{ft}}{\text{sec}} = 95 \text{ ft/sec}$$

Question 8. (1 mark) Convert 1520 ft·lb bending moment to N·m (Newton meters).

$$1520 \text{ ft} \cdot \text{lb} \cdot \frac{4.45 \text{ N}}{1 \text{ lb}} \cdot \frac{1 \text{ m}}{3.28 \text{ ft}} = 2062.19 \text{ N} \cdot \text{m} \\ = 2060 \text{ N} \cdot \text{m}$$

Question 9. (1 mark) Convert a load of 2450 lbs into kN (kilo Newtons).

$$2450 \text{ lbs} \cdot \frac{4.45 \text{ N}}{1 \text{ lb}} \cdot \frac{1 \text{ k}}{10^3} = 10.9025 = 10.9 \text{ kN}$$

Question 10. (1 mark) Convert a load of 60 kN/m into lbs/ft.

$$60 \frac{\text{kN}}{\text{m}} \cdot \frac{10^3}{1 \text{ k}} \cdot \frac{1 \text{ m}}{3.28 \text{ ft}} \cdot \frac{1 \text{ lb}}{4.45 \text{ N}} = 4110 \text{ lbs/ft} = 4000 \text{ lbs/ft}$$

Question 11. (1 mark) Given 250 lbs/ft³ convert to kg/m³.

$$250 \frac{\text{lbs}}{\text{ft}^3} \cdot \frac{3.28 \text{ ft}}{1 \text{ m}} \cdot \frac{3.28 \text{ ft}}{1 \text{ m}} \cdot \frac{3.28 \text{ ft}}{1 \text{ m}} \cdot \frac{0.453 \text{ Kg}}{1 \text{ lbs}} = 3996 \text{ Kg/m}^3 \\ = 4.0 \times 10^3 \text{ Kg/m}^3$$